

Last-minute abstracts of 2023 Padua Days of Muscle and Mobility Medicine (2023 Pdm3) and 2023 Editorial board of EJTM

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Abstract

The 2023 Padua Days of Muscle and Mobility Medicine (Pdm3) are scheduled from March 29th to April 1st, 2023. The abstracts collected during autumn and early winter of 2022 were e-published in the issue 33 (1) 2023 of the European Journal of Translational Myology (EJTM). Now the last-minute abstracts are reported here (100 Oral presentations are listed in the final Program). All together they confirm the interest of very different international specialists, filling the four days of 2023Pdm3. Indeed, scientists and clinicians from *Austria, Bulgaria, Canada, Denmark, France, Georgia, Germany, Iceland, Ireland, Italy, Mongolia, Norway, Russia, Slovakia, Slovenia, Spain, Switzerland, The Netherlands and USA* will gather to the Hotel Petrarca of Thermae of Euganean Hills, Padua, Italy. The apparent heterogeneity of the specialists, collectively *raccolti* under the umbrella of the Mobility Medicine neologism is stressed by the need to extend the Sections of the 2023 Editorial Board of EJTM also here reported. We hope that Speakers of the 2023 Pdm3 and readers of EJTM will submit "Communications" to the European Journal of Translational Myology by May 20, 2023 and/or to the 2023 Special Issue: "Pdm3" of the Journal *Diagnostics*, MDPI, Basel, Switzerland with deadline September 30, 2023. See you soon at the Hotel Petrarca of Montegrotto Terme, Padua, Italy. For a promo of the 2023 Pdm3 link to: <https://www.youtube.com/watch?v=zC02D4uPWRg>

Key Words: Padua Days of Muscle and Mobility Medicine (Pdm3); last minute abstract; European Journal of Translational Myology and Mobility Medicine, PAGEpress, Pavia, Italy; *Diagnostics*, MDPI, Basel.

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The Padua Muscle Days (PMDs), i.e., meetings of biology, physiology, medicine and rehabilitation of skeletal muscle started more than 30 years ago, precisely to provide advice on Translational Myology. Recently the interests broadened to complementary disciplines and neologisms were found necessary, specifically Mobility Medicine and the Padua Days of Muscle and Mobility Medicine (Pdm3). Despite the worsening evolution of the East-Europe crisis, the program of the 2023 Pdm3 was confirmed in autumn 2022 with Scientific Sessions to occur over four full days at either the *Guariento Hall* of the Galilean Academy of Arts, Letters and Sciences of Padua (March 29, 2023) and then in the Conference Hall of the Hotel Petrarca, Thermae of Euganean Hills (Padua), Italy. Collected during fall 2022, the titles and abstracts of approximately 90 oral presentations were

listed in evolving preliminary schedules.¹ Here we add 10 last-minute Abstracts, bringing the final Program to 100 Oral Presentations. The four days of 2023 Pdm3 will include senior and junior scientists and clinicians from *Austria, Bulgaria, Canada, Denmark, France, Georgia, Germany, Iceland, Ireland, Italy, Mongolia, Norway, Russia, Slovakia, Slovenia, Spain, Switzerland, The Netherlands and USA*. Together with the Final Programme, the two Collections of Abstracts are published in electronic format in issue 33 (1) 2023 of the European Journal of Translational Myology (EJTM). The apparent heterogeneity of the specialists, gathered under the umbrella of the neologism Mobility Medicine, is underlined by the need to expand the Sections of the EJTM 2023 Editorial Board also reported here. In the two Complementary Collections some empty Abstracts

appear with only names and affiliations of authors, due to the decision of the speakers not to disclose their unpublished results. It is a pity that this happens, but in the meantime, we stress that those decisions are strong evidence of the relevance of the 2023 Pdm3. Readers are invited to personally join the Meeting in Padua Galilean Academy of Arts, Letters and Sciences and in the Conference Hall of the Hotel Petrarca to get a preview of the original results of the best laboratories performing translational research on muscle and mobility medicine. See you in the late afternoon of March 28, 2023 for an aperitive at the Hotel Petrarca of Montegrotto Terme, Euganean Hills (Padua), Italy. We are confident that the 2023 Pdm3 will be as interesting as the successful events of the last years.²⁻¹⁴

For a promo of the 2023 Pdm3 link to: <https://www.youtube.com/watch?v=zC02D4uPWRg>

Finally, we would like to thank those organizers/chairs that were more able to attract speakers to the 2023 Pdm3, specifically: Elisabeth R. Barton, Ines Bersch-Porada, Paolo Gargiulo, Elena P. Ivanova, Christiaan Leeuwenburgh, Marco V. Narici, Riccardo Rosati, Piera Smeriglio, Carla Stecco, Daniela Tavian and H. Lee Sweeney.

List of acronyms

EJTM - European Journal of Translational Myology
MDPI - Molecular Diversity Preservation International
Pdm3 - Padua Days on Muscle and Mobility Medicine
PMD – Padua Muscle Days

Acknowledgments

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Conflict of Interest

The authors disclose no conflicts of research and publication interest or any specific endorsements of the products referenced in this manuscript.

Ethical Publication Statement

We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

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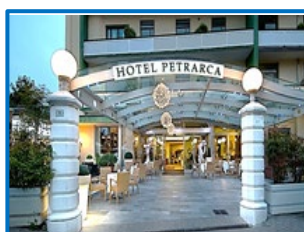
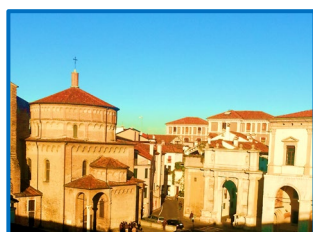
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Organizers: Elisabeth R. Barton, Ines Bersch-Porada, Ugo Carraro, Marcus Coplin, Raffaele De Caro, Paolo Gargiulo, Elena P. Ivanova, Helmut Kern, Nathan K. LeBrasseur, Christiaan Leeuwenburgh, Alessandro Martini, Stefano Masiero, Marco V. Narici, Rosanna Piccirillo, Riccardo Rosati, Marco Sandri, Piera Smeriglio, Carla Stecco, H. Lee Sweeney, Sandra Zampieri

WEDNESDAY March 29, 2023

08:00 AM Complimentary Bus Transfer to Padua

Guariento Hall, Galilean Academy of Arts and Science of Padua, Italy

09:00 AM Openings Raffaele De Caro, Marco V. Narici, Ugo Carraro: Greetings and thanks to lecturers, speakers, audience and sponsors

09:20 AM Lecture of Carlo Reggiani, University of Padua, Italy: Single muscle fibers as a tool in aging research

10:00 AM Session I: Adaptations to Physical Exercise in Aging: from cell to functioning
 Marco V. Narici, Roberto Bottinelli, Chairs

10:00 AM Russell T. Hepple, University of Florida, USA: Skeletal muscle plasticity to resistance training in pre-frail/frail elderly women

10:20 AM Julian Alcázar Caminero, Universidad de Castilla-La Mancha, Toledo, Spain: Improving muscle power through exercise in old age

10:40 AM Simone Porcelli, University of Pavia, Italy: Home-based aerobic exercise training improves skeletal muscle oxidative metabolism in old people

11:00 AM Martino Franchi, University of Padua, Italy: Differential muscle adaptations to concentric and eccentric resistance training in older people

11:20 AM Marco V. Narici, University of Padua, Italy: The neuroprotective effects of exercise in older age

11:40 AM Gianni Biolo, University of Trieste, Italy: Nutrient-exercise interaction on muscle mass and function in aging

12:00 AM Maria Chiara Maccarone, Barbara Ravara, Walter Giuriati, Stefano Masiero, Ugo Carraro, University of Padua, Italy: Combating muscle weakness in bed-ridden elderly with Home-based Full-Body in-Bed Gym (hbFBiBG): Basics, Implementation and Preliminary Results of the Padua Initiative

12:20 AM Ugo Carraro, University of Padua, Italy: Blood contamination a lucky chance to analyze non-invasively Myokines in mouth fluids

12:30 AM Daniela Tavian, Ester Tommasini, et al., Milan, Italy: Irisin and sarcopenia: salivary irisin is induced by strenuous exercise and correlates with circulating irisin

12.45 AM Lunch in Piazza Duomo, Padua, Italy

WEDNESDAY March 29, 2023

Guariento Hall, Galilean Academy of Arts and Sciences of Padua, Italy

02:00 PM **SESSION II: Skeletal Muscle Epigenetics and the dark side of the genome**

Piera Smeriglio, Marco Sandri, Chairs

02:00 PM **Marco Sandri, et al., University of Padua, Italy:** Discovering novel longevity genes by looking at the dark side of the genome

02:20 PM **Chiara Lanzaolo, National Institute of Molecular Genetics, Milan, Italy:** Chromatin conformation of muscle stem cells in physiological and pathological muscular aging

02:40 PM **Isabella Scionti, INMG, Lyon, France:** Epigenetic modifiers role in modulating muscle stem cell plasticity

03:00 PM **Piera Smeriglio, Sorbonne Université, Paris, France:** Understanding epigenetics in spinal muscle atrophy: how the yin and yang of genomic regulation contribute to the disease

03:20 PM **Giuseppina Caretti, et al., Milan University, Italy:** Epigenetic targeting of BET proteins rewire metabolism in the aged skeletal muscle

03:40 PM **Silvere M. van der Maarel, Leiden University Medical Center, The Netherlands:** Facioscapulohumeral Dystrophy: Incomplete Repression of the Cleavage Stage Transcription Factor DUX4 in Skeletal Muscle

04:00 PM **SESSION III: Adaptations in Aging: from molecules to functioning**

Amber L. Pond, Rosanna Piccirillo, Chairs

04:00 PM **Amber L. Pond, Southern Illinois University School of Medicine in Carbondale, IL, USA:** The HERG K⁺ channel increases intracellular calcium in myotubes by modulation of Calsequestrin

04:20 PM **Hans Hoppeler, University of Bern, Switzerland:** Fascia, Facts and Fantasies

04:40 PM **Rosanna Piccirillo, et al., IRCCS - "Mario Negri", Milan, Italy:** MyoRep: a novel reporter system to detect early muscle atrophy in vivo

05:00 PM **Paolo Grumati, Telethon Institute of Genetics and Medicine, Naples, Italy:** Selective autophagy and ER dynamics during muscle differentiation

05:15 PM **Bert Blaauw, University of Padua, Italy:** The role of Akt-mTORC1 signaling in regulating muscle mass and function

05:30 PM **Tania Zaglia, et al., University of Padua, Italy:** Circulating muscle-derived miR-206 links skeletal muscle dysfunction to heart sympathetic denervation

05:45 PM **Stefano Schiaffino, University of Padua, Italy:** Who is Terje Lømo, a 88-year-YOUNG scientist still fully active!

06:00 PM **Lecture of Terje Lømo, University of Oslo, Norway: Body temperature regulation by muscle tone**

06:40 PM **Complimentary Bus Transfer to Hotel Petrarca, Thermae of Euganean Hills (Padua), Italy**

08:00 PM **Dinner in Hotel Petrarca**

THURSDAY March 30, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

09:00 AM SESSION IV: FES managements of acquired muscle diseases,

Ines Bersch-Porada, Helmut Kern, Chairs

- 09:00 AM Winfried Mayr, University of Vienna, Austria: Electrical stimulation in lower motoneuron lesions, from scientific evidence to clinical practice: a successful transition – The Engineer perspectives
- 09:20 AM Ines Bersch-Porada, Functional Electrical Stimulation Center, Notwill, Switzerland: Electrical stimulation in lower motoneuron lesions, from scientific evidence to clinical practice: a successful transition - The Physiotherapist experience and researcher perspective
- 09:40 AM Ashraf Gorgey, School of Medicine, Virginia Commonwealth University, Richmond, VA, USA: Home-Based Electrical stimulation training for SCI persons with lower motor neuron injury
- 10:00 AM Giovanna Albertin, University of Padua, Italy: Skin improvements by home-based FES
- 10:15 AM Giovanni Pegoraro, Neuromuscular Rehabilitation Center, Fondazione Borghi, Varese, Italy: Neuromuscular electrical stimulation of hand in post-COVID syndrome
- 10:30 AM Ugo Carraro, University of Padua, Italy: 40 years of basic and applied myology for hbDDM FES in 10 slides
- 10:45 AM Break

THURSDAY March 30, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

- 11:00 AM Lecture of H. Lee Sweeney, University of Florida, Gainesville, FL, USA: *Improving upon AAV.micro-dystrophin gene therapy for DMD*
- 11:40 AM SESSION Va: Genetic muscle diseases - Elisabeth R. Barton, H. Lee Sweeney, Chairs
- 11:40 AM Kay Ohlendieck, Maynooth University, Maynooth, Co. Kildare, Ireland: Proteomic profiling of reactive myofibrosis in the aged and dystrophic diaphragm
- 12:00 AM Philippe Perrin, et al., Development, Adaptation and Handicap, University of Lorraine, France: Postural control impairments in Fabry disease
- 12:30 AM Lunch

THURSDAY March 30, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

02:00 AM SESSION Vb: Genetic muscle diseases - Capucine Trollet, H. Lee Sweeney, Chairs

- 02:00 AM Elisabeth R. Barton, University of Florida, Gainesville FL, USA: Novel role of store operated Ca²⁺ entry in Limb-Girdle Muscular Dystrophy 2A
- 02:20 AM Capucine Trollet, Sorbonne Université, INSERM, Myology Institute, Paris, France: Cell and molecular actors of fibrosis in muscle diseases
- 02:40 AM Massimo Ganassi, King's College London, London, UK: Investigating pathogenic mechanisms in FSHD myogenesis

THURSDAY March 30, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

03:00 PM - SESSION VI: Twenty Years of AIM

Daniela Tavian, Corrado Angelini, Chairs

- 03:00 PM** *Gabriele Siciliano et al., University of Pisa, Italy: Phenotype variabilities of laminopathies*
- 03:15 PM** *Alberto Benetollo, et al., DSB, University of Padua, Italy: Pharmacological profile of the most promising CFTR corrector for sarcoglycanopathy treatment*
- 03:30 PM** *Francesco Dalla Barba, et al., DSB, University of Padua, Italy: Zebrafish and sarcoglycanopathies: Characterization of models suitable for phenotype-based screening of drugs*
- 03:45 PM** *Gulia Ricci, et al., University of Pisa, Italy: New avenues for treatment of facioscapulohumeral MD*
- 04:00 PM** *Giovanna Cenacchi, et al., Alma Mater Studiorum University of Bologna, Italy: Two plasma circulating-miRs for the diagnosis of idiopathic inflammatory myopathies*
- 04:15 PM** *Roberta Costa, et al., Alma Mater Studiorum University of Bologna, Italy: Morpho-functional characterization of Transportin3 in myogenic differentiation of a cell model of LGMD D2*
- 04:30 PM** *Giosuè Annibalini, et al., University of Urbino Carlo Bo, Urbino, Italy: N-glycosylation inhibition impairs C2C12 and L6 myoblast differentiation and IGF-1 signalling*
- 04:30 PM** *Ester Tommasini, Daniela Tavian, et al., Milan, Italy: Irisin and sarcopenia: salivary irisin is induced by strenuous exercise and correlates with circulating irisin*
- 04:45 PM** *Massimiliano Filosto, NeMO-Brescia Clinical Center for Neuromuscular Diseases, University of Brescia, Italy: Clinical and genetic characterization of Neutral lipid storage disease with myopathy (NLSDM)*
- 05:00 PM** *Braek*
- 05:15 PM** *Fabiola Moretti et al., Catholic University of Rome, Roma, Italy: Estrogens recover muscle regeneration impaired by the pathogenic gene, DUX4, in orthotopic human xenograft*
- 05:30 PM** *Abbass Jaber, et al., Evry University, Inserm, Evry, France: Perturbations of cholesterol metabolism in the dystrophic muscle in DMD*
- 05:45 PM** *Michele Guescini, et al., University of Urbino Carlo Bo, Italy: Modulation of vesicles' secretion by EPS in an in vitro muscle model*
- 06:00 PM** *Alessia Geremia, et al., University of Padua, Italy: Activation of muscle-specific Akt1 reverts cancer-dependent muscle wasting and reduces tumor mass*
- 06:15 PM** **Lecture of Jonathan Jarvis, Liverpool John Moores University, UK: Transcriptomic and growth responses to programmed resistance training in mouse, rat and human**
- 07.30 PM** *Dinner*

FRIDAY March 31, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

09.00 AM SESSION VII: Senescence & Rejuvenation

Nathan K. LeBrasseur, Christiaan Leeuwenburgh, Chairs

- 09:00 AM Nathan K. LeBrasseur, Mayo Clinic, Rochester, MN, USA: Cellular senescence as a driver of skeletal muscle aging
- 09:30 AM David Hood, York University, Canada: Impact of age and sex on lysosomes and mitophagy during muscle use and disuse
- 10:00 AM Christiaan Leeuwenburgh, University of Florida, Gainesville, FL, USA: Inflammation, mitochondrial dysfunction senescence in skeletal muscle with aging and in peripheral artery disease
- 10:30 AM Agnese De Mario, et al., University of Padua, Italy: Pharmacological modulation of MCU in skeletal muscle
- 10:40 AM Maira Rossi, et al., University of Pavia, Italy: Nitrate supplementation promotes an anabolic response and attenuates neuromuscular alterations in 24-months old male mice
- 10:50 AM Nicola Fiotti, et al., University of Trieste, Italy: Insulin resistance modification during bed rest: relationship with circulating and muscular MMP and TIMPs

FRIDAY March 31, 2023

ROOM B, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

09:30 AM Practical Course on functional analysis of the stomatognathic system

Claudia Dellavia, Riccardo Rosati, Chairs

09:30-11:00: Riccardo Rosati, Milan, Italy: Instrumental evaluations of the stomatognathic apparatus: static tests

11:15-12:30: Claudia Dellavia, Milan, Italy: Instrumental evaluations of the stomatognathic apparatus: dynamic tests,

For dentists who want to review/expand the functional analysis protocols of the stomatognathic system developed at the Laboratory of Functional Anatomy of the Stomatognathic Apparatus (LAFAS) of the University of Milan, Italy

FRIDAY March 31, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

11:00 AM SESSION VIII: Muscle Fascia, biology and pathology - Carla Stecco, Alessandro Martini, Chairs

- 11:00 AM Carla Stecco, University of Padua, Italy: Fascia and aging
- 11:15 AM Diego Cazzador, et al., Otolaryngology Unit, Department of Neurosciences University of Padua, Italy: Tensor Tympani: unveiling a hidden muscle
- 11:30 AM Carmelo Pirri, et al., University of Padua, Italy: Ultrasound imaging and fasciae
- 11:45 AM Caterina Fede, et al., University of Padua, Italy: How sex hormones can affect the fasciae: Implication for pain
- 12:00 AM Giovanna Albertin, et al., University of Padua, Italy: Lymphatic vessels detection in subcutis and superficial fascia
- 12:15 AM Lucia Petrelli, et al., University of Padua, Italy: Innervation and vascularization of the superficial fascia
- 12:30 AM Lorenza Bonaldi, et al., University of Padua, Italy: Biomechanical properties of the fascial system
- 12.45 AM Ilaria Fantoni, et al., Orthopedics and Orthopedic Oncology, Department of Surgery, Oncology and Gastroenterology (DiSCOG), University of Padua, Italy: Fascia Lata alterations in hip osteoarthritis: An observational cross-sectional study
- 13:00 PM Lunch

FRIDAY March 31, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua)

Italy

- 02:00 PM** **Lecture of Paolo Gargiulo, University of Reykyavik, Iceland: 3D Quantitative Muscle Color Computed Tomography**
- 02:40 PM** **SESSION IX: Non-invasive Assessments in Myology - Paolo Gargiulo, Ugo Carraro, Chairs**
- 02:40 PM** **Riccardo Forni, et al., University of Reykyavik, Iceland: Virtual cardiac histology: a densitometric characterisation of left ventricular tissue**
- 02:50 PM** **Debora Jacob, et al., University of Reykyavik, Iceland: Assessing early-stage Parkinson's Disease using a moving platform (BioVRSea)**
- 03:00 PM** **Valentina Betti, et al., University of Reykyavik, Iceland: An in silico 3d approach to evaluate bone remodelling after total hip arthroplasty: a six years longitudinal study**
- 03:10 PM** **Federica Ciliberti, et al., University of Reykyavik, Iceland: Novel strategies for cartilage assessment, interplay between bone and muscles**
- 03:20 PM** **Carlo Ricciardi, Alfonso Maria Ponsiglione, University of Federico II, Naples, Italy: Interplay between the age and the asymmetry of NTRA in elderly people**
- 03:30 PM** **Magnus Gislason, et al., University of Reykyavik, Iceland: Time shift of peak activation levels in quadriceps and hamstrings after ACL reconstruction during single leg jump**
- 03:40 PM** **Ettore Rocchi, et al., University of Urbino Carlo Bo, Urbino, Italy: Exploring myofibrillar alignment in muscular tissue**

FRIDAY March 31, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

- 04:00 PM** **SESSION X: Muscle Rehabilitation in Dentistry, Riccardo Rosati, Elena P. Ivanova, Chairs**
- 04:00 PM** **Elena P. Ivanova, Rehabilitation and Balneology Center, Moscow, Russia: Innovative methods of full dental rehabilitation**
- 04:15 PM** **Gaia Pellegrini, University of Milan, Italy: Standardised protocols for sEMG of the masticatory muscles in oral rehabilitation**
- 04:30 PM** **Francesca Ferrante, et al., University of Pavia, Italy: Electromyographic analysis of masticatory muscles before and after rapid palatal expansion**
- 04:45 PM** **Roberto Rongo, University of Naples Federico II, Italy: Masticatory muscles pain management**
- 05:00 PM** **Mauricio Gonzalez Balut, Centro Ortodoncico Especializado, Mexico City, Mexico: Definite Orthodontic treatment for patients with Temporomandibular Joint problems and Craniomandibular Dysfunctions**
- 05:15 PM** **Bazar Amarsaikhan, Mongolia: Chewing hard food and its importance for general health**
- 05:30 PM** **Avtandil Bakradze, Tbilisi State Medical University, Tbilisi, Georgia: Peculiarities of the chewing muscles electrophysiological activity in mouth breathing individuals**
- 05:45 PM** **Mariana Dimova-Gabrovska, Department of Prosthetic Dentistry, Medical University-Sofia, Bulgaria: Craniomandibular dysfunctions – modern diagnostic methods**
- 06:00 PM** **Giuseppe Messina, et al., University of Palermo, Italy: Intra-articular ultrasound-guided injection with Hyaluronic Acid and corticosteroid in retrodiscal tissue for Temporomandibular disorders**
- 06:15 PM** **Marieta Karadjova, et. al., Department of Neurology, Medical University-Sofia, Bulgaria: Improvement of gait, balance and coordination after application of Taopatch® device**
- 06:30 PM** **Francesco Mantia, et al., University of Palermo, Italy: Effects of Platelet-Rich-Plasma injection in association with therapeutic exercise in the management of medial epicondylitis**
- 06:45 PM** **Lecture of Feliciano Protasi University of Chieti, Italy: Mechanisms underlying exercise-dependant remodelling of the sarcomeric system: the role of temperature and pH**
- 07:30 PM** *Dinner*
- 09:00 PM** **AFTER DINNER ACTIVITIES**

SATURDAY April 1, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

09:00 AM Session XI: LBI workshop on muscle rehabilitation - from mouse to elderly

Sandra Zampieri, Feliciano Protasi, Chairs

- 09:00 AM Feliciano Protasi, University of Chieti, Italy: Mimicking disuse and rehabilitation in a mouse model
- 09:30 AM Antonio Musarò, University Sapienza of Rome, Italy: Molecular biological basis and effects of immobility and training in young and aging
- 10:00 AM Sandra Zampieri, University of Padua, Italy: C-Terminal Agrin Fragment as a biomarker of muscle wasting and weakness in aging and disuse
- 10:30 AM Jan Cvecka, University of Bratislava, Slovakia: Exercise intervention in elderly: a novel system within the Centre of Active Aging in Bratislava
- 11:00 AM Nejc Sarabon, University of Primorska, Slovenia: Relationship between 24-hour movement behaviour and physical performance in older adults: A cross-sectional insight into the Centre of active ageing data
- 11:30 AM Stefan Loeffler, Helmut Kern, LBI Rehabilitation Research, Vienna, Austria: AMB-REMOB – results of an early outpatient rehabilitation program
- 12:00 AM Vincent Grote, Michael Fischer, LBI Rehabilitation Research, Vienna, Austria: Outcomes of early rehabilitation in elderly patients
- 12.30 AM Lunch

SATURDAY April 1, 2023

12:30 AM Complimentary Transfer to Medical Hotel Ermitage (restricted to 15 Attendees)

Medical Hotel Ermitage, Thermae of Euganean Hills (Padua) Italy

- 12:45 PM Practical Activities on European Medical Thermalism - Stefano Masiero, Chair
- 12:45 PM Working Lunch in Medical Hotel Ermitage
- 01:15 PM Marco Maggia, Director of the Medical Hotel Ermitage: Balneotherapy, Mud and Physiotherapies for Prevention & Rehabilitation in the Medical Hotel Ermitage, a pioneering 15-year successful example
- 02:00 PM Complimentary Transfer to Hotel Petrarca Thermae of Euganean Hills (Padua) Italy

SATURDAY April 1, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

02:40 PM Lecture of Helmut Kern, LBI Rehabilitation Research, Vienna, Austria: Underwater physiotherapy after knee replacement

03:20 PM SESSION XIIa: European Medical Thermalism and the World Federation Hydrotherapy (FEMTEC) - Umberto Solimene, Stefano Masiero, Chairs

- 03:20 PM Umberto Solimene, Center Integrative Medicine, State University Milan, Italy: World Thermal Clusters
- 03:40 PM Maria Chiara Maccarone, Ugo Carraro, Stefano Masiero, University of Padua, Italy: Balneology and Health Resort Medicine and rehabilitation in the Euganean Hills Thermae: building the future
- 04:00 PM Daniele Coraci, et al. University of Padua, Italy: Technological transition of different rehabilitation approaches: challenges and answers
- 04:20 PM Break

SATURDAY April 1, 2023

Conference Hall, Hotel Petrarca, Thermae of Euganean Hills (Padua) Italy

04:30 PM SESSION XIIb: European Medical Thermalism and the World Federation Hydrotherapy (FEMTEC)

Stefano Masiero, Elena P. Ivanova, Chairs

04:30 PM *Anna Mihaylova, Medical University of Plovdiv, Bulgaria: Balneotherapy - prospects for the development of health tourism in Bulgaria*

04:50 PM *Andrey Rachin, Rehabilitation and Balneology Center, Moscow, Russia: Modern methods of neuro-rehabilitation*

05:10 PM *Marcus Coplin, Balneology Association of North America, Naturopathic Healthcare, Pagosa Springs, Colorado, USA: A case study of balneotherapy in Fibromyalgia*

05:30 PM *Maxim Yu. Yakovlev, et al., Rehabilitation and Balneology Center, Moscow, Russia: Correction of increased meteosensitivity of obese patients when using Terrainkur, taking into account the bioclimatic characteristics during stay in health resorts*

05:50 PM *Kirill V. Terente, et al., Moscow regional research clinical institute named after M.F. Vladimirovsky, Moscow, Russia: Video analysis of patients' gait during Terrainkur in obese people*

06:10 PM *Irina A. Grisechekina, Rehabilitation and Balneology Center, Moscow, Russia: Outcomes of rehabilitation programs in patients with post-COVID-19 syndrome*

06:30 PM *Stefano Masiero, University of Padua, Italy: Final remarks*

07:00 PM ***Ugo Carraro: Adiò, Adiós, Arrivederci, Auf Wiedersehen, Au revoir, Goodbye to the 2024 Padua Days on Muscle and Mobility Medicine – Padua, Italy, March 13-16, 2024***

07:30 PM *Dinner*

09:00 PM ***AFTER DINNER ACTIVITIES***

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LAST-MINUTE ABSTRACTS of the 2023 Pdm3

WEDNESDAY March 29, 2023

*Aula Guariento, Galilean Academy of Arts, Letters
and Science, Padua, Italy*

**SESSION III: Adaptations in Aging: from
molecules to functioning**

Amber L. Pond, Rosanna Piccirillo, Chairs

2023Pdm3 March 29 - Abstract 98

**Circulating muscle-derived miR-206 links skeletal
muscle dysfunction to heart sympathetic denervation**

Marco Ronfini (1,2),* Di Mauro V. (3),* Prando V. (1,2),* Franco-Romero A. (1,2), Antonio Mazzaro (4), Favaro G. (2), Lo Verso F. (2), Dokshokova L. (1,2), Armani A. (1,2), Gianni Sorarù (5), Guescini M. (6), Catalucci D. (3), Marco Mongillo (1,2), Marco Sandri (1,2),§ Tania Zaglia (1,2)§ - *, §, equal contributions

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On-site presentation of unpublished results. The author denied Zoom circulation, recording and post-meeting dissemination by YOUTUBE

Pdm3 March 29 - April 1, 2023

2023Pdm3 March 29 – Abstract 99

Sympathetic neuropathology is revealed in muscles affected by Amyotrophic Lateral Sclerosis

Antonio Mazzaro (1,2), Veronica Vita (1,2), Marco Ronfini (2,3), Irene Casola (4), Arianna Klein (2), Gabriella Dobrowolny (4), Gianni Sorarù (5), Antonio Musarò (4,6), Marco Mongillo (2,3,7),* Tania Zaglia (2,3)* - *, §, equal contributions

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Padua, Padua, Italy; (4), Laboratory Affiliated to Institute Pasteur Italia-Fondazione Cenci Bolognietti, DAHFMO-Unit of Histology and Medical Embryology, Sapienza University of Rome, Rome, Italy; (5) Department of Neuroscience, Azienda Ospedaliera di Padova, Padua, Italy; (6) Scuola Superiore di Studi Avanzati Sapienza (SSAS), Sapienza University of Rome, Italy; (7) CNR Institute of Neuroscience, Padua, Italy.

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On-site presentation of unpublished results. The author denied Zoom circulation, recording and post-meeting dissemination by YOUTUBE

Pdm3 March 29 - April 1, 2023

THURSDAY March 30, 2023

*Conference Hall, Hotel Petrarca,
Thermae of Euganean Hills (Padua) Italy*

09:00 AM SESSION IV:

FES managements of acquired muscle diseases

Ines Bersch-Porada, Helmut Kern, Chairs

2023Pdm3 March 29 – Abstract 100

Neuromuscular electrical stimulation of hand in post-COVID syndrome

Giovanni Pegoraro (1), Alessandro Ambrosi (2)

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The global pandemic of coronavirus disease 2019 (COVID-19) has revealed a surprising number of extrapulmonary manifestations of the SARS-CoV-2 infection. There have been emerging reports related to COVID-19 infection and disease course including myositis, neuropathy, arthropathy, and soft tissue abnormalities in lower and upper limb too. NMES can be used to induce a muscle contraction when it is difficult or impossible for the person to achieve this voluntarily thereby allowing effective exercise and the strengthening of muscles observed that usual programs for amyotrophy couldn't provide any muscular contraction. So we propose specific neuro muscular electrostimulation (NMES) parameters at low frequency to increase upper limb

muscles strength. We studied 10 patients who developed diffuse and symmetrical muscle weakness after a long stay in the intensive care unit (ICU). We applied 30 minutes a day for two months three different frequency electrostimulation to:

1. Arm extensor muscles because they provide help to the control of the trunk in sitting and standing position
 2. Intrinsic muscles because of their severe hypotrophy.
- We applied the following parameters of frequency:

1. Amyotrophy frequency 30-40 hz, 250 μ s
2. Study frequency 1-2 hz, 250 μ s
3. Triangular stimulation 0,2 hz, 250 μ s

Muscle contractions have been detected by visualization and a biofeedback EMG device. In the arm extensor at the beginning only low Frequency and high intensive stimulation could provide muscle contraction. After two months of high intensive stimulation, and physiotherapy, muscle normal excitability seemed to be restored. About hand intrinsic muscle, triangle impulse resulted the best parameters. We treated very severe weak muscle in patient after long covid. In conclusion, to reanimate muscular function of arm extensor muscles, hypotrophy muscle stimulation tetanic parameters have not provide any muscular activity. Only low frequency (1-2 hz) high intensity stimulation (80-120 mAmp) could achieve muscular contraction.

Key Words: Skeletal muscle weakness; COVID-19 pandemic syndrome; electrical stimulation parameters.

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Pdm3 March 29 - April 1, 2023

THURSDAY March 30, 2023

Conference Hall, Hotel Petrarca,

Thermae of Euganean Hills (Padua) Italy

SESSION VI: Twenty Years of AIM

Daniela Tavian, Corrado Angelini, Chairs

2023Pdm3 March 29 - Abstract 101

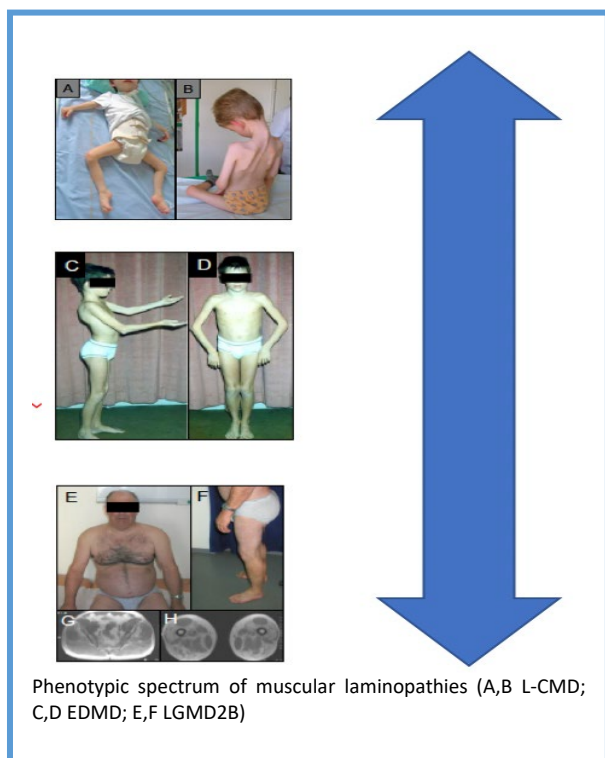
Phenotype variabilities of laminopathies

Gabriele Siciliano (1), Gabriele Vadi (1), Francesca Torri (1), Mariaconcetta Rende (1), Giovanna Lattanzi (2), Giulia Ricci (1)

(1) Department of Clinical and Experimental Medicine, University of Pisa, Pisa, Italy; (2) CNR Institute of Molecular Genetics Unit of Bologna; IRCCS Istituto Ortopedico Rizzoli, Bologna, Italy.

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LMNA-related disorders, or laminopathies, are rare diseases caused by mutations in the LMNA gene, which encodes for the nuclear envelope proteins, lamin A and C, via alternative splicing. The main functions of lamins are to provide structural support to the nucleus, maintenance of nuclear shape and spacing of nuclear pore complexes. Over the years, numerous reports have suggested that lamins also take part in other processes: chromatin organization, DNA replication, epigenetics, transcription, cell cycle regulation, cell development and differentiation, nuclear migration, and apoptosis. Lamins together with integral membrane proteins of nuclear envelope and associated proteins participate in the regulation of chromatin organization and formation of chromatin microdomains associated with nuclear envelope. Laminopathies are associated with a wide range of disease phenotypes, including neuromuscular, cardiac, metabolic disorders and premature aging syndromes. Different phenotypes with skeletal muscle involvement have been linked to LMNA mutations: limb-girdle muscular dystrophy type 1B (LGMD1B, old nomenclature); autosomal dominant Emery-Dreifuss muscular dystrophy (EDMD2) and the rarer recessive form (EDMD3), a form of congenital muscular dystrophy, the LMNA-related congenital muscular dystrophy (L-CMD). Although lamins A/C are expressed in almost all cells and tissues, the high degree of tissue-specificity (i.e., skeletal muscle, cardiac muscle, adipose tissue, peripheral nerve) and the resulting different phenotypes observed in laminopathies are not completely elucidated. Moreover, therapeutic approaches to laminopathies are as yet symptomatic and no cure is currently available for any of these diseases. These considerations provide evidence of the extent to which an Italian Network for Laminopathies (NIL), involving



centers spread throughout Italy and involved in clinics, research, industry and patients and their associations can help in addressing the study of those diseases and finding a therapeutic strategy. The use of corticosteroids to improve muscle power in of patients with L-CMD has been proposed, despite to date there is no clear indications to support the use of corticosteroids in these patients and reliable biomarkers to demonstrate (or monitor) the effectiveness of the treatment is not available. Corticosteroids have anti-inflammatory activity and are able to modify the secretion of some cytokines. A study in a cohort of patients affected by muscular laminopathies found that TGF beta 2 secretion is consistently elevated in subjects with EDMD2 or other muscular laminopathies, except in L-CMD. Interestingly, our studies indicate that patients affected by L-CMD have a strongly altered profile of inflammatory cytokine secretion. This profile is also very different from that observed in patients affected by EDMD2, a form with later onset and slow progression of muscle disease. In fact, in L-CMD patients we observed an increase of interleukin 17, interleukin 9 and interleukin 1 receptor, whereas in patients with EDMD2 we reported a constant increase in TGFbeta 2 which was normal in L-CMD children. It is therefore reasonable to suppose that a different profile of the secretome may be related to the greater severity of the clinical picture of L-CMD. Starting from the collaborative approach and the multidisciplinary effort of the Italian Network for Laminopathies, we are performing an open-label prospective cohort pilot study to evaluate the effect of the treatment with Deflazacort in a cohort of clinically and molecularly well-characterized L-CMD patients.

Key Words: Lamin A/C; laminopathies; limb-girdle muscular dystrophy type 1B; Emery-Dreifuss muscular dystrophy (EDMD2), LMNA-related congenital muscular dystrophy (L-CMD).

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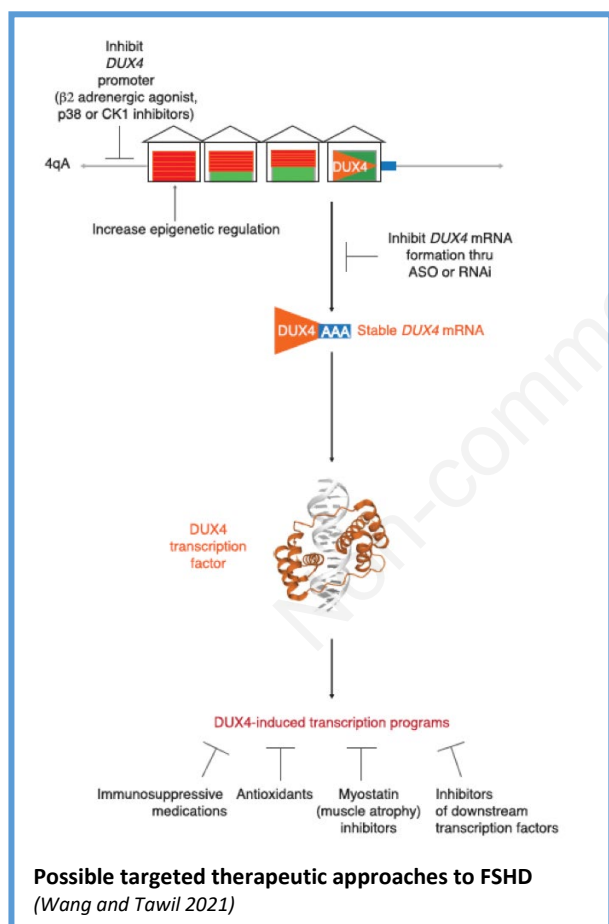
2023Pdm3 March 29 - Abstract 102

New avenues for treatment of Facioscapulohumeral Muscular Dystrophy

Giulia Ricci, Francesca Torri, Beatrice Ciurli, Gabriele Siciliano

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Facioscapulohumeral muscular dystrophy (FSHD) is one of the most common forms of muscular dystrophy overall. Symptoms can present during childhood up until late adulthood, with an average age at onset of 30 years; a selective pattern of skeletal muscle weakness and a wide spectrum of disease expression are commonly observed, also within the families. The pathogenic molecular mechanism is believed to reside in an aberrant



expression of the DUX4 gene due to abnormal levels of hypomethylation in the D4Z4 region on chromosome 4q35. DUX4 is a double-homeobox transcription factor that is normally expressed during em-bryogenesis and activates a core set of genes involved in zygotic development; it is then silenced in most adult tissues except thymus and testis. While evidence is growing

about phenotypical variability and possible different disease courses, knowledge of pathophysiologic mechanisms underlying those differences is still far from comprehensive. As clinical trials are finally approaching also for FSHD, understanding of the interplaying factors determining disease course, phenotypic characterization of patients, and choosing appropriate outcome measures is crucial for correct selection of molecules, trials' design and selection of endpoints. To date, there are no approved treatments for FSHD and standard of care only implies personalized physical therapy and management of motor disability. In the last years we observed the evolution of FSHD clinical trials from non-specific anabolic or anti-inflammatory/oxidant strategies, to cutting-edge molecular therapies targeting DUX4. The accepted hypothesis involving aberrant DUX4 expression in skeletal muscle has guided the research pipeline for targeted therapies, in particular treatments reducing DUX4 gene expression. Among them, Losmapimod, a p38-mitogen activated protein kinase inhibitor that has been studied in multiple fields from oncology to cardiovascular medicine, has been proposed as a novel treatment for FSHD and a phase III clinical trial is currently recruiting patients.

Key Words: Facioscapulohumeral Muscular Dystrophy (FSHD); D4Z4; DUX4; D4Z4 methylation; epigenetic modifiers.

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Pdm3 March 29 - April 1, 2023

2023Pdm3 March 29 - Abstract 103

Lecture of Jonathan Jarvis

Transcriptomic and growth responses to programmed resistance training in mouse, rat and human

Jonathan Jarvis (1), Mark Viggars (1,2), Hazel Sutherland (1), Lauren Harlow (3), Christopher Cardozo (3)

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Mice are commonly used to investigate muscle biology and disease, but many labs have found it difficult to produce whole muscle hypertrophy without chronic overload or very long periods of training. We have established a model of muscle growth in the rat using programmed contractions in which the plantar flexors are used to resist the dorsiflexors of the ankle [1, 2]. We will present data from experiments in the rat that show a marked increase of muscle mass, showing how the acute transcriptomic response 1 hour after an exercise session changes as a muscle adapts to daily exercise over 30 days. We will also show that a similar degree of hypertrophy is achieved after 30 days with exercise every three days, and that the transcriptomic response in this case shows less change towards an 'endurance' expression profile. We will also present evidence from experiments using the same approach in mice, comparing the transcriptomic response of mouse muscle and rat muscle to the same protocol. In mice we see similar changes in gene expression but no increase in muscle mass. Future comparison of the transcriptomic and protein synthetic and degradative mechanisms in these models will be informative.

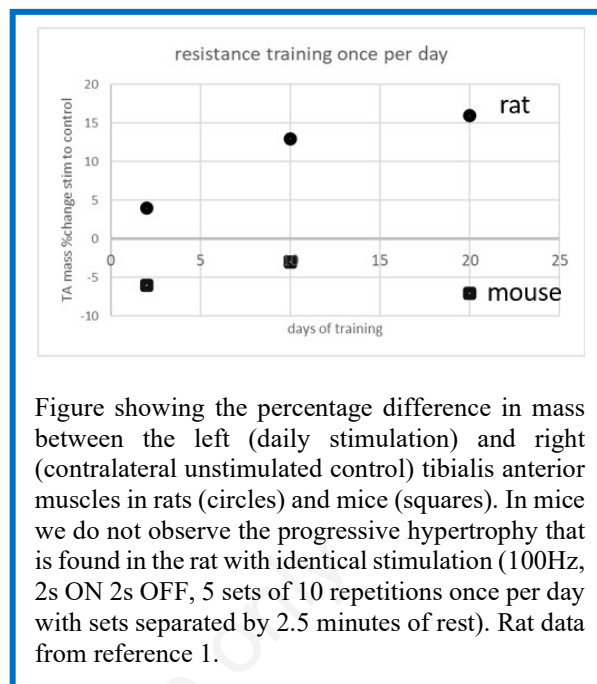


Figure showing the percentage difference in mass between the left (daily stimulation) and right (contralateral unstimulated control) tibialis anterior muscles in rats (circles) and mice (squares). In mice we do not observe the progressive hypertrophy that is found in the rat with identical stimulation (100Hz, 2s ON 2s OFF, 5 sets of 10 repetitions once per day with sets separated by 2.5 minutes of rest). Rat data from reference 1.

Key Words: Skeletal muscle hypertrophy; skeletal muscle transcriptome; exercise response; muscle adaptation.

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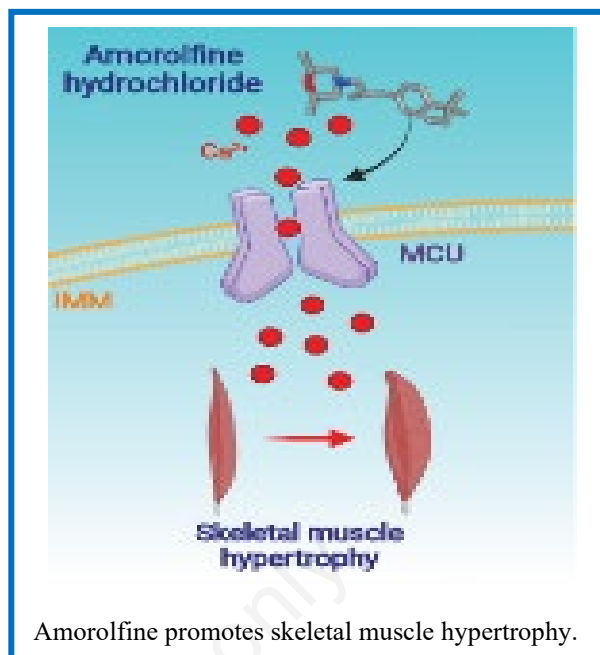
FRIDAY March 31, 2023*Conference Hall, Hotel Petrarca,
Thermae of Euganean Hills (Padua) Italy***09:00 AM SESSION VII:****Senescence&Rejuvenation***Nathan K. LeBrasseur, Christiaan Leeuwenburgh,
Chairs***2023Pdm3 March 31 - Abstract 104****Pharmacological modulation of MCU in skeletal muscle**

Agnese De Mario (1), Ilaria Piazza (1), Rosario Rizzuto (1), Cristina Mammucari (1,2)

(1) Department of Biomedical Sciences, University of Padua, Italy; (2) Myology center (CIR-Myo), University of Padua, Italy.

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Skeletal muscle mitochondria readily accumulate Ca^{2+} in response to SR store-releasing stimuli thanks to the activity of the mitochondrial calcium uniporter (MCU), the highly selective channel responsible for mitochondrial Ca^{2+} (mit Ca^{2+}) uptake. In skeletal muscle, MCU-dependent mit Ca^{2+} positively regulates myofiber size by impinging on PGC1 α and IGF1-AKT/PKB pathways.¹ While the genetic modulation of the MCU has been widely applied, small molecules able to increase mit Ca^{2+} uptake are rare. Spermine and related polyamines lower the threshold of mit Ca^{2+} uptake.² The p38 mitogen-activated protein kinase inhibitor SB202190 modulates mit Ca^{2+} with a mechanism independent of p38 activity.³ Several natural plant flavonoids increase MCU activity independently of their antioxidant activity.⁴ Agonists and antagonists of the estrogen receptor as 4,4',4''-(4-propyl-[1 h]-pyrazole-1,3,5-triyl)trisphenol (PPT), diethylstilbestrol, and 17- β -estradiol modulate the activity of the uniporter. By using a well-established methodology based on Aequorin, a calcium-sensitive probe that emits light upon Ca^{2+} binding, we screened a library of 1,600 FDA-approved drugs for their ability to modulate mit Ca^{2+} uptake in living cells. We identified Amorolfine as a positive MCU modulator.⁵ Amorolfine is a morpholine antifungal drug that inhibits enzymes of the fungal sterol synthesis pathway and it is indicated for the topical treatment of mycoses. Amorolfine increases mit Ca^{2+} uptake in HeLa, C2C12 cells and adult isolated myofibers without affecting cyto Ca^{2+} and mitochondrial membrane potential. In agreement with the role of MCU in triggering hypertrophy, Amorolfine increases the size of C2C12 myotubes in an MCU-dependent manner. Moreover Amorolfine significantly increases the cross-sectional



area of TA and EDL muscle fibers when injected for one week in TA muscles. In light of the role of mit Ca^{2+} uptake in sustaining aerobic metabolism the positive modulation of MCU by Amorolfine increases oxygen consumption rate in flexor digitorum brevis (FDB)-isolated myofibers.⁵ Thus, the positive modulation of MCU by Amorolfine could be useful to sustain muscle trophism in different conditions characterized by muscle atrophy.

Key Words: Skeletal muscle hypertrophy; mitochondrial calcium; positive MCU modulators; Amorolfine.

References

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Pdm3 March 29 - April 1, 2023

FRIDAY March 31, 2023

*Conference Hall, Hotel Petrarca,
Thermae of Euganean Hills (Padua) Italy*
10:30 AM SESSION VIII:
Muscle Fascia, biology and pathology
Carla Stecco, Alessandro Martini, Chairs

2023Pdm3 March 31 – Abstract 105

Tensor Tympani: unveiling a hidden muscle

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The Tensor Tympani muscle (TTM), a small muscle placed in the medial-anterior portion of the middle ear cavity, represents a subject of lively debate. Its function and activity have been investigated for decades, but still remain unclear. Aiming to collect the available knowledge regarding this structure, the authors performed a review of the literature. Particular attention was dedicated to its anatomy and physiology. It is known that the TTM reacts to different stimuli, both auditory and non-auditory. It was hypothesized its role in the middle ear reflex to protect the cochlea from high-intensity noises, in synergy with the stapedius muscle. Moreover, the activity of the TTM was demonstrated to determine a conductive hearing loss by stiffening the ossicular chain. Other triggers for TTM contraction were described, such as vocalization, swallowing and chewing. A relationship was proposed between the TTM and the tensor veli palatini, two muscles both developing from the first pharyngeal arch, and other masticatory muscles. Some

other non-auditory triggers can activate the TTM, including anticipation of loud sounds, orbital air jet and tactile stimulation of the face. Several theories regarding the function of TTM are still being postulated. Its neural connection with the brain and other muscles are still object of study. Its relationship with the eustachian tube could provide explanation to different pathological processes. Indeed, the function and activity of TTM have been speculated for decades, and nowadays it is not possible to state a definitive answer to its physiological role.

Key Words: Fascia; Tensor Tympani; Middle ear muscles.

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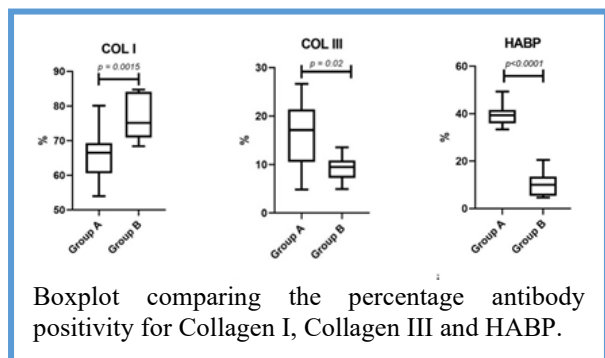
2023Pdm3 March 31 - Abstract 61

Fascia Lata alterations in hip osteoarthritis: An observational cross-sectional study

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The present study compares the structure and composition of fascia lata in healthy subjects and in patients with hip osteoarthritis (OA), to evaluate any differences in the amount of Collagen type I, Collagen



type III, and Hyaluronan. Fascia lata samples from voluntary healthy subjects and patients with OA were harvested during surgery. Collagen type I (COL I), III (COL III) antibody, and biotinylated hyaluronan binding protein (HABP) immunohistochemistry stainings were used to evaluate fascial morphology and COL I, COL III, and Hyaluronan (HA) content in both groups. Ten samples from healthy subjects (group A) and 11 samples from OA patients (group B) were collected. COL I was significantly more abundant in the OA group ($p = 0.0015$), with a median percentage positivity of 75.2 (IQR 13.11)%, while representing only 67 (IQR: 8.71)% in control cases. COL III, with median values of 9.5 (IQR 3.63)% (OA group) and 17.10 (IQR 11)% (control cases), respectively, showed significant reduction in OA patients ($p = 0.002$). HA showed a median value of 10.01 (IQR 8.11)% in OA patients, denoting significant decrease ($p < 0.0001$) with respect to the control group median 39.31 (IQR 5.62)%. The observed differences suggest a relationship between fascial pathology and hip OA. The observed increase in COL I in OA patients, along with the reduction of COL III and HA, could lead to fascial stiffening, which could alter fascial mechanics and be linked to the development and symptoms of OA.

Key Words: Fascia; hip osteoarthritis; hyaluronan; collagen; stiffness; myofascial pain.

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Pdm3 March 29 - April 1, 2023

FRIDAY March 31, 2023

*Conference Hall, Hotel Petrarca,
Thermae of Euganean Hills (Padua) Italy*
04:00 PM SESSION X:
Muscle Rehabilitation in Dentistry
Riccardo Rosati, Elena P. Ivanova, Chairs

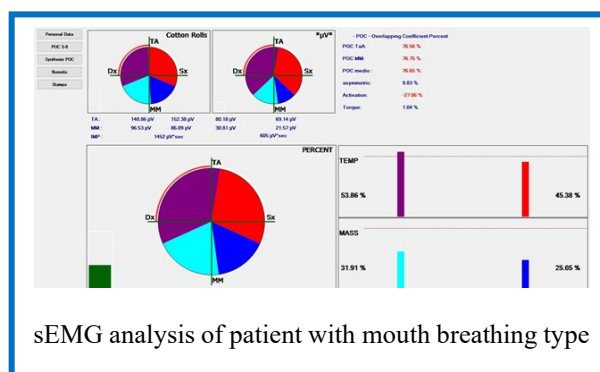
2023Pdm3 March 31 - Abstract 76

Peculiarities of the chewing muscles electrophysiological activity in mouth breathing individuals

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Various factors, that play significant role in development of facial, bony structures, formation of normal growth and functionally correct dentition, have become the subject of increasing interest recently. According to the latest studies, neuromuscular balance is considered to be the main prerequisite for preventing relapse after orthodontic treatment and also the way to optimize its outcome. One of the main factors for normal growth of the jaws is not only masticatory muscles proper, coordinated work, but also its contractility (and therefore excitability) - physiological characteristics. It should be noted, that as a result of decreased muscle activity,



significant changes in the location, size and growth of the jaws can develop, which can be manifested by the vertical growth of the face. The study was conducted on the group of 65 male and female volunteers. Several breathing tests were carried out to determine the breathing type. Cephalometric analysis was performed for all individuals to conclude the position, growth type and size of the jaws. In order to reduce the dentoalveolar proprioceptive signal, all subjects had been indicated to clench on the cotton rolls and the data was obtained during maximal voluntary contraction. In mouth breathing individuals, mean electromyographic activity of both masseter and temporalis muscles registered during maximal contraction, turned out to be inhomogeneous and asymmetric, occlusal anomalies had been noted, most often - skeletal second class.

Key Words: Electromyography; mouth breathing; skeletal growth; masticatory muscles; neuromuscular balance.

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2023Pdm3 March 31 - Abstract 106

Craniomandibular dysfunctions – modern diagnostic methods

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To examine the uses of thermodiagnosics as part of the diagnostic protocol for patients with craniomandibular disorders (CMD) is the aim of this study. The investigation is based on 68 patients, divided into two groups: main group constituting 34 patients with CMD (22 women and 12 men, at 40.1 ± 13.6 years of age) and

control group comprising 34 patients (20 women and 14 men, at 45.7 ± 13.5 years of age). Thermo-visual diagnostics was carried out twice at an interval of 20 days. Over that period of time only the patients with CMD received preprosthetic muscular preparation of the masticatory system. The analysis of thermal images from both tests in the control group indicated a high degree of thermal symmetry with the facial median line. Thermal images from patients of the main group in the first test revealed a significant percentage (91,4%) of high thermal intensities above the pathological threshold. In the second test, however, the positive thermographic findings decreased significantly in number, area and intensity. The results obtained demonstrate the benefit of infrared thermography for the visualization of basic muscular structures of the masticatory system with regard to norm and pathology. This method provides a clear image, documentary and diagnostic aid in the diagnosis for patients with CMD.

Key Words: Craniomandibular disorders; diagnostic protocol; thermodiagnosics; thermal images; masticatory system.

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SATURDAY April 1, 2023*Conference Hall, Hotel Petrarca, Thermae of
Euganean Hills (Padua) Italy***09:00 AM Session XI:*****LB1 workshop on muscle rehabilitation - from
mouse to elderly****Sandra Zampieri, Feliciano Protasi, Chairs*

2023Pdm3 April 1 - Abstract 83**C-Terminal Agrin Fragment as a biomarker of
muscle wasting and weakness in aging and disuse**

Barbara Ravara (1), Elena Monti (2,3), Fabio Sarto (4)
Martina Maino (1), Feliciano Protasi (5), Barbara
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In the last decades, the extended human longevity
resulted in increasing numbers of senior individuals in
the general population. Ageing is accompanied by a
progressive decline in muscle mass and function. It is
associated with increased risk of adverse outcomes
including knee or hip injuries and degeneration, falls, or
bone fractures, possibly determining the onset of a
clinical syndrome termed sarcopenia. Sarcopenia is not
only caused by ageing (primary sarcopenia) but may be
linked to the presence of several co-morbidities
(secondary sarcopenia), such as disuse/inactivity,
advanced organ failure, or inadequate intake of
energy/proteins. Denervation and NMJ impairment have
been proposed as key determinants of age-related muscle
wasting and weakness. Thus, screening, monitoring and
prevention of those conditions inducing muscle
dysfunction is essential to improve the quality of life,

potentially reducing ageing and sarcopenia-related social
and economic costs. To this aim, the reliability and
accessibility of non-invasive blood derived biomarkers is
being evaluated. C-terminal Agrin Fragment (CAF), a
circulating C-22 kDa peptide resulting from the
proteolytic cleavage of agrin, a protein responsible for
the neuromuscular junction (NMJ) assembly and
maintenance, has been widely investigated by us and
numerous other groups as circulating NMJ-related
biomarker of muscle dysfunction. Essentially, serum
CAF concentration was observed to increase with age
and in sarcopenic individuals when compared to age-
matched, medically stable peers. Serum CAF was
reported also to raise following chronic inactivity or
disuse and seemed to be lowered or maintained by
exercise training. Finally, CAF was found to correlate
with appendicular lean mass, handgrip and gait speed.
Therefore, CAF seems to be a specific biomarker for
screening and monitoring muscle wasting and weakness.
It may be a useful tool for tailored approaches of muscle
rehabilitation and for prevention or rescue of muscle
dysfunction. When findings will be confirmed on larger
cohort of subjects, future guidelines may be implemented
for introducing CAF as a biomarker in clinical settings.

Key Words: C-terminal Agrin Fragment; aging;
sarcopenia; muscle wasting; muscle weakness.

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2023Pdm3 April 1

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Pdm3 March 29 - April 1, 2023

Adijo, Adiós, Arrivederci, Auf Wiedersehen, Au revoir, Goodbye to the **2024 Padua Days on Muscle and Mobility Medicine (2024 Pdm3), Padua, Italy March 13-16, 2024.**

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Editorial Board 2023

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Mobility in Aging: Biology, Physiology, Prevention

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